

Office Action Summary

Application No.

09/900,165

Applicant(s)

KUO, NEAL

Examiner

Kidest Bahta

Art Unit

2125

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-10 and 12-17 is/are rejected.
- 7) ☒ Claim(s) 5 and 11 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 15 is rejected under 35 U.S.C. 102(e) as being anticipated by Lin et al. (U.S. Patent 6,292,582).

Regarding claim 15, Lin discloses that system for determining best process paths in a semiconductor manufacturing process including a plurality of operations, comprising a yield database for storing a plurality of yield data (5) corresponding to a plurality of wafer lots manufactured by the specific manufacturing process (column 27, lines 30-28), wherein each of the plurality of wafer lots includes a plurality of wafers (Fig. 25), and wherein the plurality of yield data corresponds to the plurality of the plurality of wafer lots (Fig. 22- Fig. 24); a process history database for storing a plurality of process path data (Fig. 2, element 58; column 8, lines 1-9); a memory for storing a program (40); and a microprocessor for performing the program, the microprocessor reading the plurality of yield data (Fig. 2, element 3) and process path data, using an analysis of variance method for identifying the most influential operation from the plurality of operations (column 18, lines 20-55; Fig. 19).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 6-10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Black (U.S. Patent 5,450,326) in view of Nishihata (U.S. Patent 6,714,832).

Regarding claims 1, 6-7, 12 and 14, Black discloses that providing a plurality of operations in the semiconductor manufacturing process (column 3, lines 1-12); providing a plurality of tools in at least one of the plurality of operations (column 3, lines 13-14, i.e., at step 21, the devices are subjected to a prescribed testing procedure...); providing a plurality of process paths (Fig. 2); providing a plurality of lot yields corresponding to the plurality of wafer lots (column 5, lines 29-55); setting the plurality of lot yields as responses(column 5, lines 39-47); setting the plurality of operations as control factors (column 3, lines 40-43); setting the plurality of tools as factor levels in response to at least one of the plurality of operations(column 5, lines 39-47); determining at least one of the plurality of operations by using an analysis of variance method with the responses , control factors, and factor levels (column 6, lines 20-50); determining a best tool for the one of the plurality of operations having the most influence by retrieving a maximum statistical characteristic (column 4, line 63-column 5,

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line 8, i.e., the discernment factor, which defines the quality of each lot, is a general discriminate , such as product yield).

Black fails to disclose that outputting at least one best process path from the plurality of process paths, wherein the at least one best process path includes the best tool.

Nishihata discloses that outputting at least one best process path from the plurality of process paths, wherein the at least one best process path includes the best tool (column 10, lines 26-46).

It would have been obvious to person of ordinary skill in the art at the time of invention was made to modify the teachings of Black with the teachings of Nishihata in order to provide a systematic process analysis, product quality control, and optimize an entire manufacturing process.

Regarding claims 2, 3, 8, 9 and 13, Black discloses the statistical characteristic comprises a signal to noise ratio (column 1, lines 60-67) and an average yield (column 5, lines 29-46).

Regarding claims 4 and 10, Black discloses determining at least one of the plurality of tools corresponding to the at least one of the plurality of operations as having the most contribution to the average yield (column 6, line 51-column 7, line 5).

5. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (U.S. Patent 6,292,582) in view of Nishihata (U.S. Patent 6,714,832).

Regarding claims 16 and 17, Lin discloses the limitation of claim 15, as stated above in Par. 2, however, Lin fails to disclose that the most influential operation includes a plurality of tools, and the microprocessor identifies at least one tool from the plurality of tools as being the best tool and a best process path of the semiconductor process includes the best tool.

Nishihata discloses that the most influential operation includes a plurality of tools, and the microprocessor identifies at least one tool from the plurality of tools as being the best tool (column 3, line 65-column 4, line 20) and a best process path of the semiconductor process includes the best tool (column 10, lines 26-45).

It would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify the teachings of Lin with the teachings of Nishihata in order to provide a systematic process analysis, product quality control, and optimize an entire manufacturing process.

Allowable Subject Matter

6. Claims 5 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

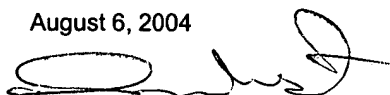
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8. Any inquiry concerning communication or earlier communication from examiner should be directed to Kidest Bahta, whose telephone number is (703) 308-6103.

Examiner can normally be reached on M-F from 7:30 a.m. to 4:00 p.m. EST. If attempts to reach examiner by phone fail, examiner's supervisor, Leo Picard, can be reached (703) 308-0538. Additionally, fax phones for Art Unit 2125 is (703) 872-9306. Any inquiry of a general nature or relating to status of this application should be directed to group receptionist at (703) 305-9600.

Kidest Bahta

August 6, 2004

A handwritten signature in black ink, appearing to be 'Kidest Bahta', written over the date.